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AN OUTLINE FOR THE PRESENTATION OF A COUNTRY—AFRICA

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In the teaching of any grand division, it is essential that the physiographic factors be clearly outlined and, then, that the responses which organic functions make to these be understood. The responses to a certain sum of physical surroundings are constant; and, as between two situations, a variation of one or more terms of the sum must account for the differences in the life elements. An analysis of the physiographic features and their resultant effects upon life can be made an aim in geography work. The fulfilment of such an objective would free many courses of study from excessive repetition, would give a unity to the geography work, would make the work of the various grades more progressive, and would furnish a logical basis for the study of the grand divisions so that they may be approached not as unknown subjects but as continuations of a former study under new combinations of controls. I am not offering a panacea for all ills, but the results of a large number of trials make me assert with considerable confidence that the idea herein presented, if undertaken, of course, in good faith, will be helpful to the teacher, and much more will be contributive to interest and knowledge and mental exercise in the pupils. The tenacity with which the terms "torrid" and "hot belt" are applied to all areas lying between the two tropics is an indication of an ignorance of the other controls of climate. It is natural to begin with sun insolation as the first factor in climatic condition, but never to grow away from the elemental notion is deplorable. By easy stages, topography, migration of wind belts, wind direction, etc., are to be added, and a comprehensive view of the variations of the climates, even in the equatorial regions, is to be obtained. The system presented in this paper is directed to the analysis of the physiographic factors and the responses resulting therefrom, then

to the synthesis of these same factors, with their more complicated resultants. For this a series of eleven maps is used, as follows :

- I. Map showing the outline with parallels and meridians. Shape and position are the subjects of discussion.
- II. Map of topography.
- III. Map of winds for January.
- IV. Map of winds for June. Maps III and IV show the limits of migration of the wind belts of the world.
- V. Map of rainfall.
- VI. Map of soils.

This ends the presentation of the physiographic factors of Africa. Up to this time the discussion of the vegetation, the animals, and especially mankind, has been mainly inference, based upon our knowledge of certain combinations of physiographic factors and their accompanying responses. Our inferences are verified or not in the maps which follow :

- VII. Map of vegetation.
- VIII A and B. Maps of vegetable products.
- IX. Map of animals.
- X. Map of commerce.
- XI. Map of population.

If the deductions are verified, as they should be in the majority of cases, there will be gained a working knowledge of the factors of geographic science, and a background for all subsequent study. On the other hand, when deductions do not accord with fact, there is afforded a chance to investigate the discrepancy, a form of exercise that is of value. The double process of deduction, and later the presentation of the facts, serve as checks on the work. The source of the variance may be an error in fact or may be accounted for by fashion or by custom. Under any circumstances, the system does not allow one to go very far afield from the truth, although generalization must play a large part at this stage. A few years ago I presented¹ this scheme, using South America as an example. The present paper enlarges upon the former, fills in certain vacancies of treatment and supplements the outline by applying the principles to Africa.

MAP I—OUTLINE, WITH PARALLELS AND MERIDIANS. Upon

¹ *Journal of Geography*, IV, 273 (1905).

any wall map the outline is sufficiently clear to read, but few wall maps give any prominence to the parallels and meridians. The subordination of the lines of latitude and longitude is a necessity if clearness of outline or detail is desired. The wall map must be adapted to many uses, but it generally brings into prominence the physical or political subdivisions of a country; and those maps are the most successfully used which emphasize an essential feature to the neglect of others. However, latitude and longitude are elements in geography, and special emphasis must be made in order to direct the pupil's attention to them. In Map I a study of the outline and position of Africa is made and only outline and position is presented. The stages of the presentation follow:

The facts of this map are (1) regular outline with no large estuary, (2) an extent in latitude corresponding with that from Raleigh, North Carolina, to Buenos Aires, (3) an extent in longitude such that five time meridians, 15 degrees west to 45 degrees east, cut the country. The time meridian of London passes through the western bulge and the time meridian of Vienna along the Nile to the extreme south. Longitude is used merely for position. The inferences are these:

A. *Climate*.—Map I furnishes us with two climatic controls, latitude and distance from the sea. The deduction, based on latitude and the inclination of the sun's rays, would be that the climate is for the most part warm. This inference, if latitude alone is the determining cause of climatic states, should be correct. The introduction of the other controls of climate shown on later maps indicates that latitudinal lines are not boundaries of climatic zones. A second statement would be that there is a great deal of rain, and this we base on the capacity of warm air for moisture and a recognition of the influences of the planetary wind circulation in equatorial regions.

B. *Soil*.—No evident relationship. However, frequently a fiord coast is an indication of glaciation and therefore glacial soils.

C. *Vegetation*.—Basing our statement on the knowledge of the vegetation of the home country or the vegetation zones as there shown, we may expect a luxuriant growth. This approaches

a climatic control more nearly than a position control, but it is not easy to keep the two apart.

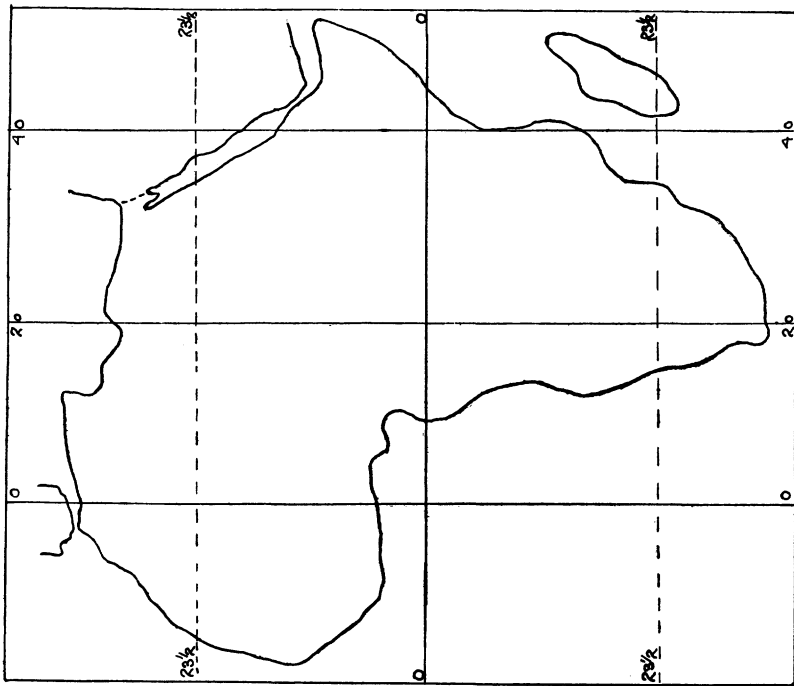
D. *Animals*.—No positive law of distribution dependent upon outline is known. However, latitude may be a barrier to migration and this again approaches closely to the climatic control.

E. *Population*.—The outline shows no indentations which are apt to be centers of population, and if this feature was the only control, the population would be sparse. As interiors of continents are secondary to coast centers and are generally subsequent in development, our conclusion may be made for the whole of Africa. In regard to the character of the people, if civilization in its varying degrees has been spoken of in terms of latitude, a statement to the effect that the people are not very far along in civilized customs is admissible.

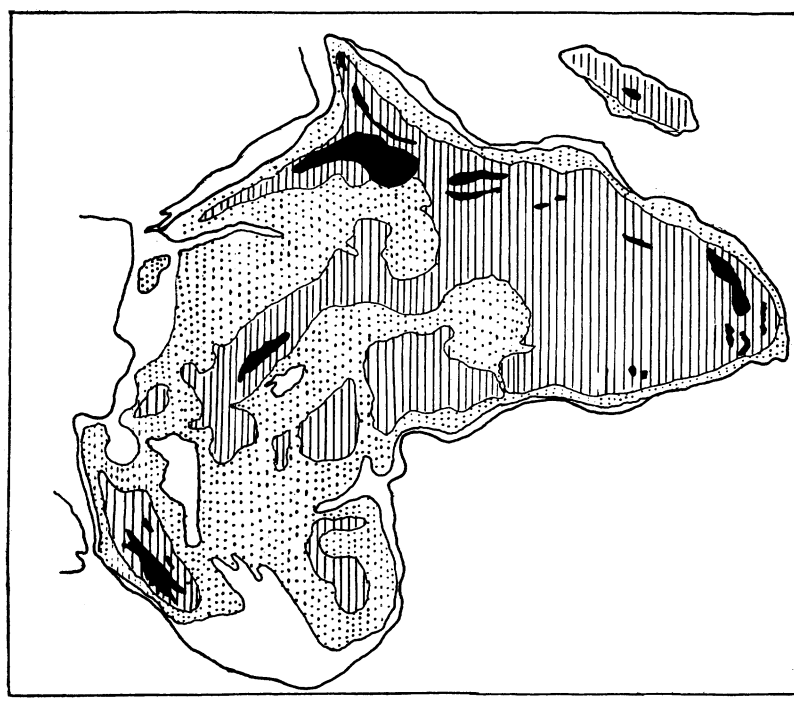
F. *Commerce*.—Commerce and population are to a large degree complementary. Commerce is developed by harbors, and if it depended upon re-entrants alone our conclusion in regard to the commercial status of a country should be at once definite and accurate. The commerce of Africa, so far as this factor is concerned, is a negligible quantity. It may be found later that some ports and cities are developed on a regular coast line, as, for example, Iquique, Chile. The reason for this situation, which would appear in the course of the development, emphasizes the leading factor of the city's growth.

MAP II.—TOPOGRAPHY. Now are added the facts of relief. The fourfold division, which may be designated mountains, highlands, uplands, and lowlands, as shown on the map, is a convenient one to use as one or more of the forms is within the experience of pupils and they are sufficiently general in character to embrace all sorts of variations, yet specific enough to be differentiated. The inferences made during the study of Map I are to be modified if need be by the facts of this map and new inferences made from the additional data.


A. *Climate*.—Two more controls of climate, altitude and slope exposure, are added by this map. The general statement of an extensive warm area in Africa, based on position, has to be changed to meet this new control. Furthermore, mountains are



MAP I.—OUTLINE MAP, SHOWING PARALLELS AND MERIDIANS



MAP II.—TOPOGRAPHIC MAP



 Above 6,500 feet

 From 1,650 to 6,500

 From 650 to 1,650

 From 0 to 650

regions of heavy rainfall; they act as deflectors of wind, so that on one side of the mountain there may be moist regions and on the other arid regions. To determine this accurately, wind direction must be known.

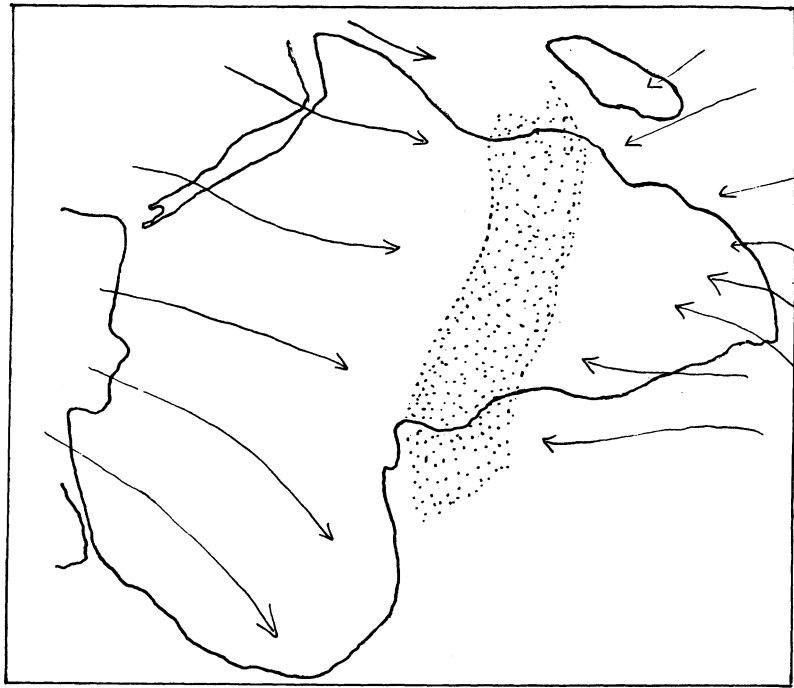
B. *Soil*.—Mountains are in the process of denudation, consequently they contain but little soil. Most commonly, metals and minerals are exposed in these regions; this is, in part, the resultant of the erosive processes which shapes the peak or chain. Lowlands are generally being aggraded, from their position, and the rocks are being buried with fertile soils. Mining is not possible to any large degree except where rivers, in the natural process of erosion, deposit in their beds precious minerals, as gold and diamonds. Between these two extremes of topography, the uplands and highlands may be expected to have coatings of soil, the amount varying roughly in inverse proportion to the height.

C. *Vegetation*.—In all localities, Alpine conditions may be experienced by the ascent of some lofty mountain. In equatorial Africa, a height of 15,000 feet would be equivalent to a latitude of 60 degrees. There is, however, this advantageous feature of high latitudes over high altitudes, namely, a longer duration of sunlight during the growing season. Vegetation would be more luxuriant in lowlands than in highlands. Here again there is demanded a restatement of the deductions made under Map I so as to accord with the topographic factor.

D. *Animals*.—Mountain sides offer in many instances good pasturage. The open country is essential to some animals as the antelope, zebra, etc., and high mountains are inhabited by species of goat and ibexes. Again, the mountain chain is apt to be a barrier to types, so that the fauna on opposite sides may be different.

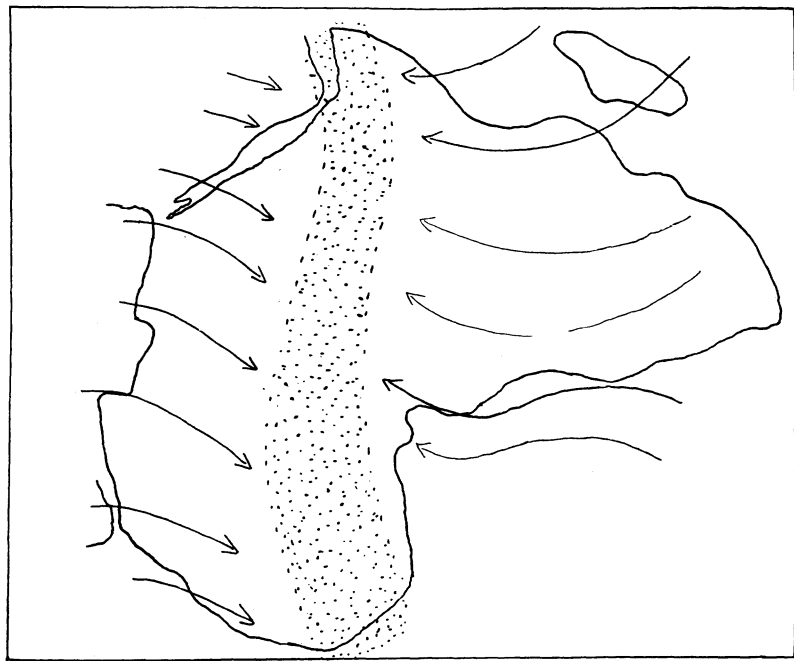
E. *Population*.—Mountain chains may separate peoples by acting as barriers, may form political boundaries, and may promote social unity and independence through protection (Abysinia). On the other hand the low countries must contain the trade centers and be the more densely populated.

F. *Commerce*.—All forms of earth surface promote or hinder trade: the mountain in proportion to its inaccessibility restrains



MAP III.—WINDS FOR JANUARY

Dotted areas show ascending currents. Arrows fly with the wind



MAP IV.—WINDS FOR JULY

Dotted areas show ascending currents. Arrows fly with the wind

it; plains and valleys facilitate transportation and thereby stimulate industry and manufacturing.

MAPS III AND IV.—THE WIND MAPS FOR JANUARY AND JULY. On these maps are shown the wind system of Africa and the limits of the migration of the wind belts.

A. *Climate*.—Winds are transporters of climates. Winds which blow from the water to the land bring to it a marine climate and moisture; winds blowing over the land are drying winds and if they blow from the interior they bear the extremes of the continental type of climate. In regions of ascending currents, warmth and moisture result; in regions of descending currents, we find cooling temperatures and prevailing clear weather. The combination now of the effects of outline, topography, and winds gives a clue to the climate of the various parts of Africa.

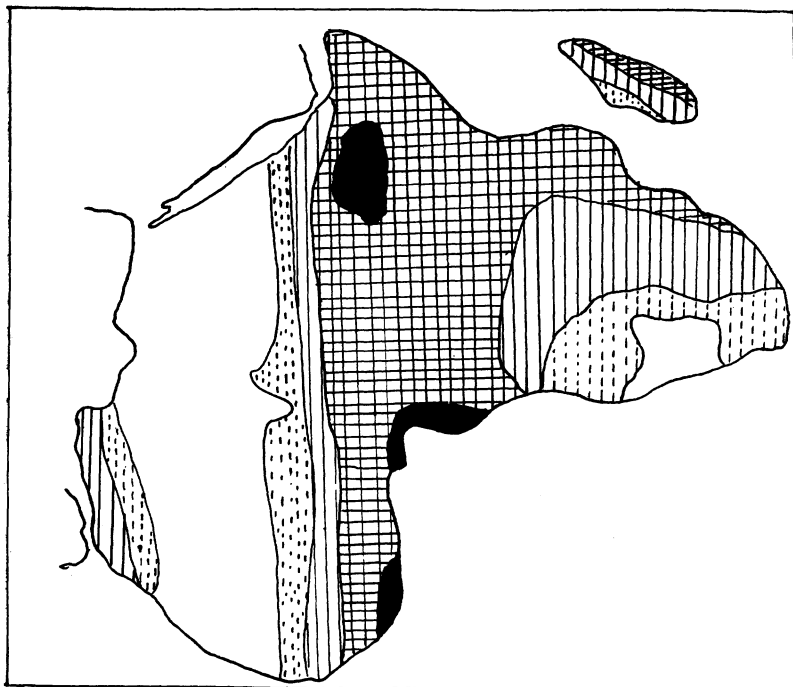
B. *Soil*.—Where winds absorb moisture, sand and salt may be expected. Sand will be found also on the leeward sides of mountains. On the windward sides of the mountains, especially at their bases, there will be much fertile soil. Sand will travel in the direction of the prevailing winds.

C. *Vegetation*.—The winds affect vegetation especially by the dispersal of seeds and, in individual cases, by shifting the centers of gravity to leeward. In regions of ascending currents the vegetation is luxuriant; in regions of parching winds, sparse; in regions of moist winds, moderate. These latter effects may be considered as resulting from rainfall, but the wind movement largely controls the precipitation.

D. *Animals*.—No noteworthy effects.

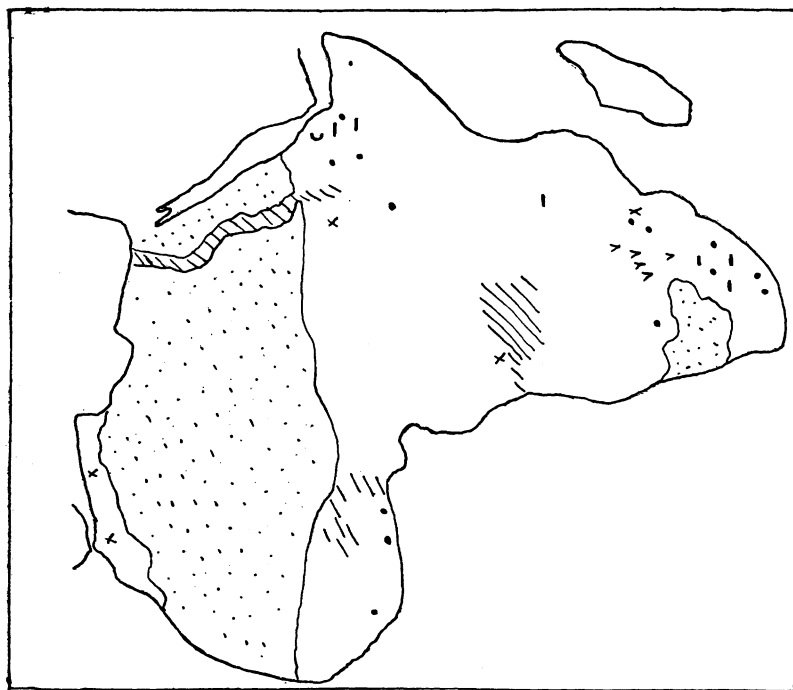
E. *Population*.—No noteworthy effects apart from such as are instanced under commerce.

F. *Commerce*.—Winds affect commerce by determining sailing routes. This cannot be said to have a large valuation today in the time of steamships. The direction of the prevailing wind in any locality determines in some measure the harbor privilege. A wind blowing toward the land and into an estuary may make an otherwise good harbor undesirable as a place of safety. This difficulty is overcome to a large degree by breakwaters, as at Algiers.



MAP V.—RAINFALL MAP

Under 10 inches annually
 10 to 20 inches
 20 to 40 inches
 40 to 80 inches
 Over 80 inches



MAP VI.—SOIL MAP

Alluvium, • Gold, — Coal, x Copper, c Silver,
 v Diamonds



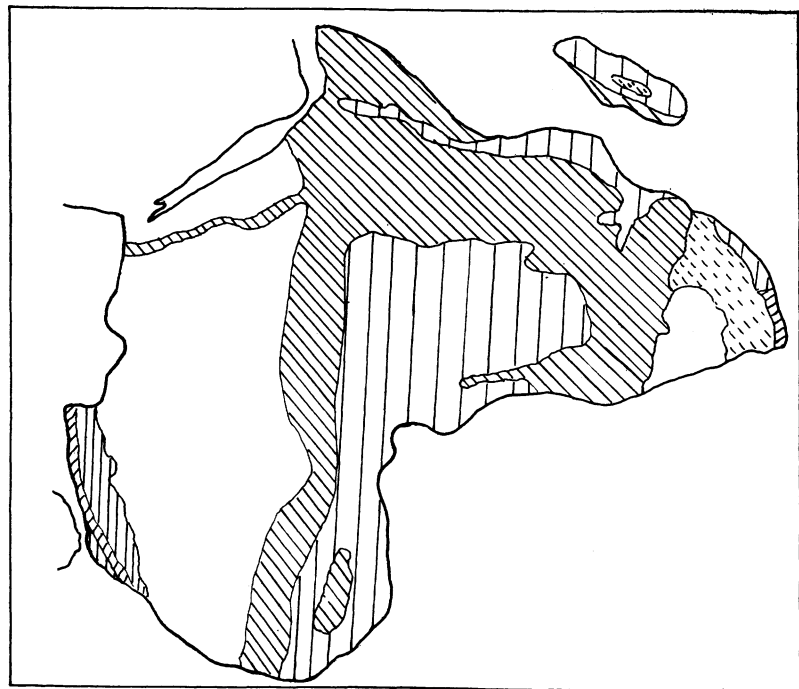
EXERCISE

The rainfall controls have been considered. A summary of these may be introduced at this time, and, if they are correctly interpreted, a rainfall map may be made by the pupils which should approach closely to the one to be presented later. On an outline map of Africa, plot the rainfall, using a fourfold classification; the regions of heavy rainfall (over 80 inches annually), the regions of moderate rainfall (20 to 80 inches), the regions of sparse rainfall (10 to 20 inches), and the regions of little or no rainfall (less than 10 inches). When this is done the rainfall map may be presented for comparison.

MAP V.—RAINFALL. This is the last of the climatic elements to be presented and the climatic condition of Africa in general terms ought to be known. It is possible to introduce the rivers of Africa at this point to good advantage. The sources of the rivers are in the mountains as the mountains are the regions of rainfall. The size of rivers depends on the amount of rainfall. The floods of rivers result from the seasonal migration of the rainfall belts as in the case of the Nile. When highlands approach near the coast, as in the case of most of Africa, falls are apt to block the river for sailing craft.

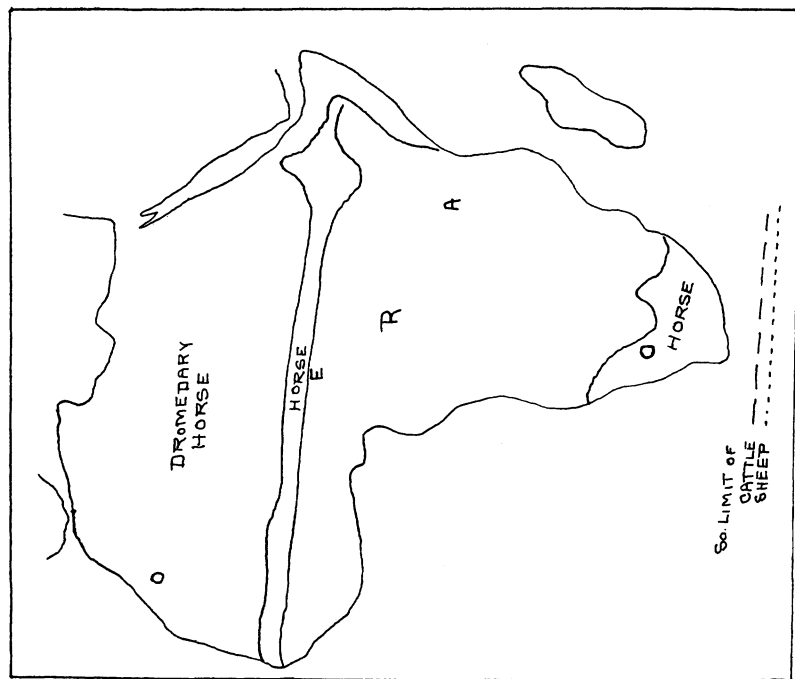
A. *Soil*.—Soil is transported by rivers and forms floodplains and deltas. The regions of interior drainage are salt, as Tchad. Mountains are in their early stages devoid of soil cover. The wearing down of the mountains is a natural mining process and yields gold and diamonds in river deposits.

B. *Vegetation*.—Climate probably influences vegetation more than any other factor. The high temperatures and heavy rains produce such luxuriant growths that clearing for agriculture is not profitable. Under more temperate conditions staple foods may be cultivated. Less than ten inches of rain annually makes vegetation a negligible quantity; when the rainfall is between ten and twenty inches, the vegetation is sparse; more than twenty inches and less than eighty gives the best conditions for cultivation of crops. Within the limits of the rainfall suitable for agriculture, an increase of rainfall is conducive to a larger yield per acre. Kinds of plants may, in the rough, be determined by



MAP VII.—VEGETATION MAP

Tropical Forests and Cultivable Lands
 Sub-tropical; Grass Plains
 Temperate; Firs and Pines prevailing
 Temperate; Grass Lands, part needing irrigation
 Desert



MAP IX.—ANIMAL MAP

O. Ostrich. A. Antelope. R. Rhinoceros. E. Elephant

the amount of water; there are the drouth plants, as the cactus; water plants, as the flags, lillies, and willows; and intermediate conditions of plant growths, ranging from Alpine carpets, prairies, deciduous forests to broad-leaved evergreens.

C. *Animals*.—Climate cannot be said to be the direct determining cause of the distribution of animals, although there are animals which must fall under such a factor of distribution, and isothermal lines are barriers to migration. Animal increase is limited by the food supply and animal migration is also so limited. Vegetation is the important function in the consideration of most animals.

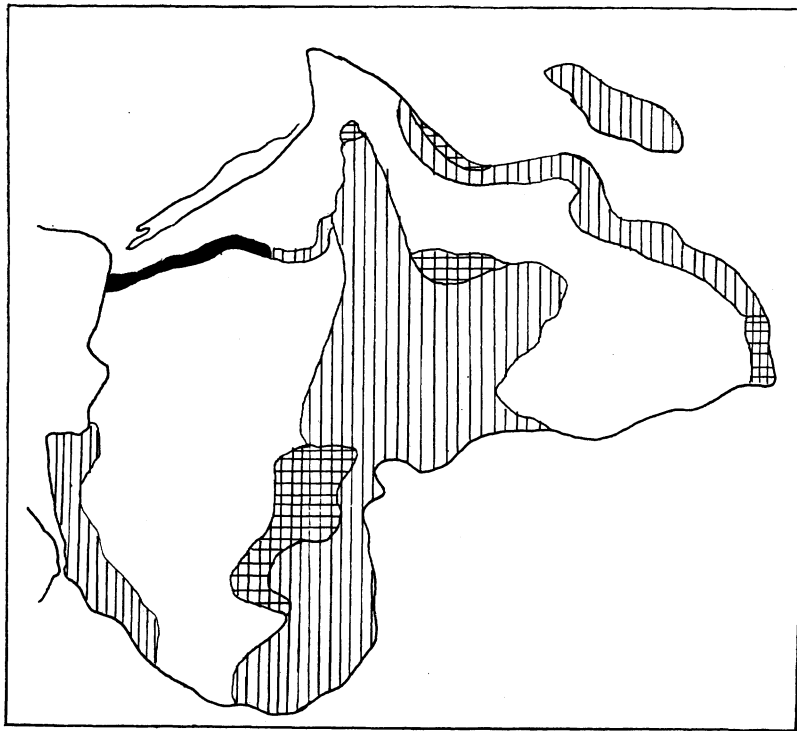
D. *Population and commerce*.—Responses are many but not important enough to find a place here.

MAP VI.—SOIL. A soil map may show the larger tracts of alluvial soil as flood plains and deltas, sandy areas and the location of the mineral products.

A. *Vegetation*.—Sandy soils do not retain moisture and are therefore not adapted to much plant growths. Alluvial plains are fertile. On leeward sides of sandy areas vegetation may be destroyed by drifting sand.

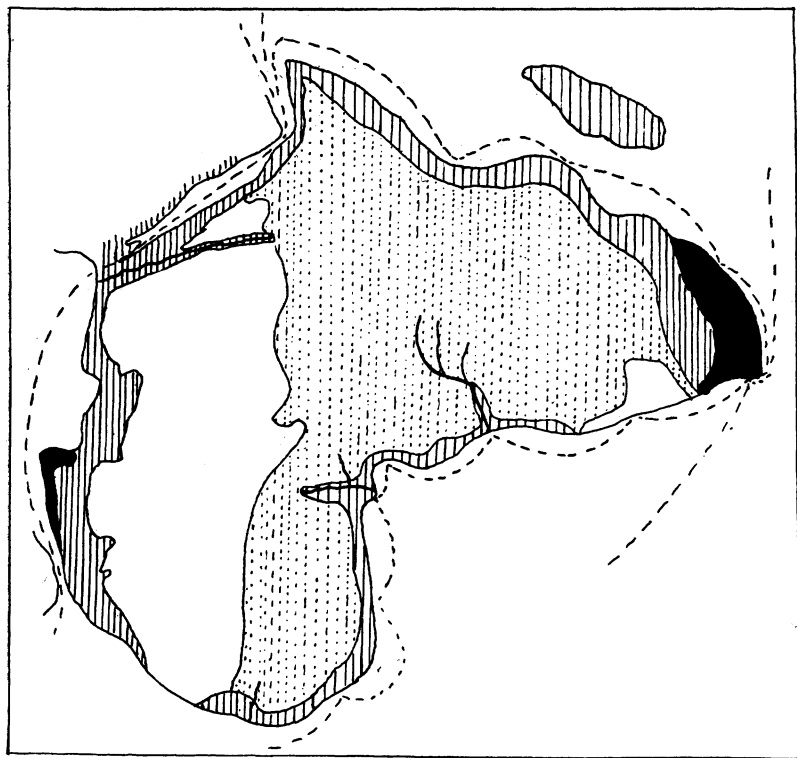
B. *Population and commerce*.—Minerals attract people to almost uninhabitable mountains. Certain minerals in the process of mountain destruction are borne by rivers and deposited in river gravels and loams, as gold and diamonds, and these influence the distribution of population and are of commercial value. Around coal outcrops population gathers. The sandy wastes are devoid of a settled population except here and there where water issues from the earth. In lesser ways soil and rocks affect people by furnishing or limiting building material.

All the physiographic factors have now been presented. The remaining maps show the responses to these and the lessons from this time on are in the main a verification or a correction of the inferences made. Before the next map is presented, it is possible to introduce an exercise which may also serve as a review. From the factors already discussed which influence vegetation, construct a vegetation map. This map will of necessity show quantity, not kinds.



MAP X.—POPULATION MAP

Over 500 to a square mile
 50 to 100
 10 to 50
 Less than 10



MAP XI.—COMMERCIAL MAP

Regions of Large Commerce
 Regions of Important Commerce
 Regions Commercially Undeveloped
 Desert or Unproductive Regions
 Navigable Rivers
 Steamer Lines

MAP VII.—VEGETATION. Introduced for verification of statements deduced from the conditions.

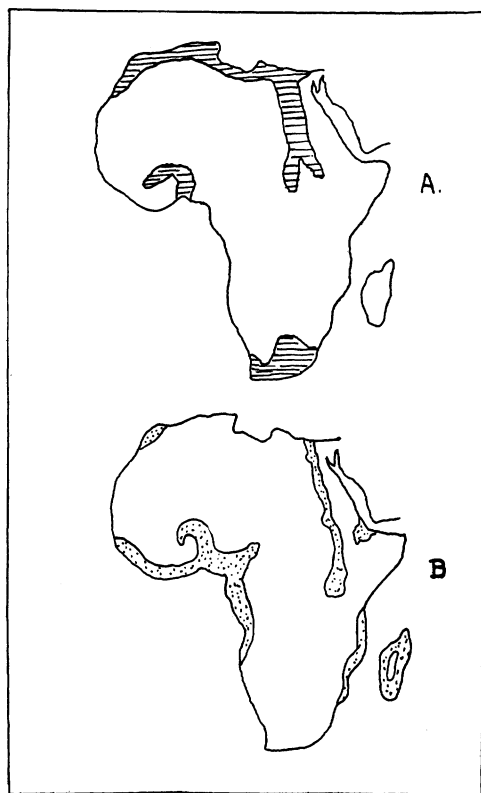
MAP VIIIA AND VIIIB. These maps may show the areas where wheat and rice are raised. Two forms of exercise may be used in this connection. From similarity of conditions of growth, kinds may be located, and from location of kinds, the condition of the climate may be inferred. For example: Rice requires 60 to 80 degrees for ripening, an abundance of moisture and the nourishment of low alluvial lands within the tropics. This is the condition of growth. From what has been found out concerning the climate of Africa, locate where rice may grow. Compare with Map VIIIB. Again, given Map VIIIB, infer the conditions of the climate and soil in those regions of rice-culture shown and note how the inferences agree with the conclusions already reached. The same sort of exercise may be carried out for sugar cane, cotton, coffee, wheat, and dates.

MAP IX.—ANIMALS. This map shows but a limited number of features, namely, the ranges of cattle and beasts of burden and the locations of a few typical native animals. In this portion of the subject it is well to omit much generally included under this heading. Large grazing areas and the distribution of wild animals which yield a product of commercial value are legitimate topics. In order to avoid confusion, but two or three of the wild animals should be mentioned. The items that determine the distribution and the increase of animal life have been considered under previous maps; there remains now the restatement in terms of the facts presented. Mountain ranges, rivers and arms of the sea, isothermal lines, deserts and forests act as barriers limiting the range of animals.

MAP X.—POPULATION. Before this map is presented, the construction of a population map may be tried by the pupils after a review of the factors determining the distribution. The facts are obtained for comparison afterwards from Map X. A study of the native population, the true negroes of Central Africa, and the related types, as the Negroids and the Bushmen, as well as the Arab invaders, may be introduced here if desired.

MAP XI.—COMMERCE. As before, a commercial map may be

constructed by the pupils in anticipation of the facts. The effects of elevation upon industry and commerce may be seen in the plateau region of Africa; of lack of rainfall in the Kalahari Desert and the Sahara; of alluvial plains in the Nile Valley; of



MAP VIII A.—DISTRIBUTION OF WHEAT

MAP VIII B.—DISTRIBUTION OF RICE

underground waters in parts of the Sahara; of minerals in the gold and diamonds of South Africa; of animals in the grazing and ostrich culture of South Africa; and of location in Tripoli's caravan trade. In further explanation of certain conditions, it should be added that a bad government is detrimental to commerce as is illustrated by the case of Morocco.

The presentation of the political divisions follows naturally

the study of the larger view. It is generally the custom to take up in some detail and order each country of a continent. In the presentation by means of the maps nearly every feature of value in the study of any one of the subdivisions may be presented, consequently there remains nothing new but to give a name to certain sections of the continent and to explain one or two social, political, or historical phases which have been instrumental in the development. Thus, the study of the individual countries, as Egypt, South Africa, Abyssinia, and so on, may be now used as a review or an exercise.

Some avoidance of names of cities, rivers, etc., has been exercised in this paper. This was intentional in order to satisfy a double demand. In the first place, in the great uncertainty concerning what names ought to be taught and what names ought to be omitted, I did not desire to dictate; again, inasmuch as the plan herein presented is applicable to other grand divisions and as well to limited portions of them, I wished to furnish an outline as free from specific references to Africa as possible. The teacher knows to a great degree what names she is expected to use and these are easily fitted into the study at the proper time.